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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/056,497 | JAVIDI, BAHRAM | |
| | Examiner | Art Unit | |
| | Brian P. Werner | 2621 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-14,22,24-53 and 66-82* is/are pending in the application.

4a) Of the above claim(s) *35,42-53 and 66-82* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14, 22, 24-34, 36-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 November 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. The following Office Action is responsive to the amendment received on March 21, 2005. The claim status is as follows:

Pending: 1-14, 22, 24-53, 66-82;

Withdrawn: 35, 42-53 and 66-82.

Therefore, clams 1-14, 22, 24-34, 36-41 are examined herein.

### *Drawings*

2. The formal drawings received on November 3, 2003 have been placed in the file.

3. Figures 1, 6, 7, 8 and 10 are objected to because as depicting block representations of physical parts without "readily identifiable" descriptors as required by 37 CFR 1.84(n). Rule 84(n) requires "labeled representations" of graphical symbols, such as blocks; and any that are "not universally recognized may be used, subject to approval by the Office, if they are not likely to be

confused with existing conventional symbols, and if they are readily identifiable." In the case of figures 1, 6, 7, 8 and 10, some of the blocks depicted therein are not readily identifiable per se. For example, see block 36 of figure 1, blocks 44, 48, etc. of figure 6, blocks 20, 44, etc. of figure

7. Each block that is not universally recognized or readily identifiable should have a corresponding label that identifies its function or purpose.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

4. The disclosure is objected to because of the following informalities: Page 7 of the specification refers variously to figures 4 (e.g., figure 4A, figure 4B, etc.). However, it appears that figures 5 were the intended figures of reference because they depict the subject matter described. Appropriate correction is required.

Applicant's Remarks Received on March 21, 2005

Applicant refers to a specification amendment at page 13, second paragraph of the remarks. However, a specification amendment did not accompany the claim amendment of March 21, 2005 and therefore the specification objection is maintained.

***Claim Objections***

5. The following quotations of 37 CFR § 1.75(d)(1) is the basis of objection:

> (d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. (See § 1.58(a)).

Claim 1 is objected to under 37 CFR § 1.75 as failing to conform to the invention as set forth in the remainder of the specification. Claim 1 requires "each of the arrays of pixels [be] defined by a plurality of arrays of lenses". However, the specification and original drawings do not conform to this requirement. Rather, the disclosed invention requires that each array of pixels be defined by a single lens of an array of lenses. For example, refer to figures 1, 2A and 2B, where each lens 32 of the array 24 of figure 1 produces a singe image of the object, as depicted in figures 2A and 2B, and where each individual image is captured by a plurality of corresponding pixels of the detector as depicted at numeral 34 of figure 3. Because this claim limitation originally existed in original claim 16, it is part of the original disclosure. Therefore, the claim is objected to under 37 CFR § 1.75 which requires the claim to conform to the invention as set forth in the remainder of the specification. Normally, the examiner would

suggest amending the specification to provide a proper antecedent basis for the claimed subject matter. However, in this case, this is not suggested. Due to the complete lack of disclosure of "each of the arrays of pixels [being] defined by a plurality of arrays of lenses", and because of the seeming impossible nature of such a requirement, a 35 U.S.C. 112 rejection is advanced hereinbelow where an assumption is made regarding how the claim should read.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. MPEP 2173.03, Inconsistency Between Claims and Specification Disclosure or Prior Art, inasmuch as it relates to the "specification disclosure", states:

> "Although the terms of a claim may appear to be definite, inconsistency with the specification disclosure ... may make an otherwise definite claim take on an unreasonable degree of uncertainty. *In re Cohn*, 438 F.2d 989, 169 USPQ 95 (CCPA 1971); *In re Hammack*, 427 F.2d 1378, 166 USPQ 204 (CCPA 1970). In Cohn, the claim was directed to a process of treating a surface with a corroding solution until the metallic appearance is supplanted by an "opaque" appearance. Noting that no claim may be read apart from and independent of the supporting disclosure on which it is based, the court found that the description, definitions and examples set forth in the specification relating to the appearance of the surface after treatment were inherently inconsistent and rendered the claim indefinite."

Claims 2 and 3 further limit the "processing" to the "periodic pixels" set forth by claim 1, in addition to "other pixels", where the "periodic pixels" are "periodic horizontally" and the "other pixels" are "periodic vertically".

The specification disclosure, at page 6, lines 16-20, states (with emphasis added) that "to reconstruct an image at a specific viewing angle (view angle), information corresponding o the ... horizontal pi3l of each horizontal elemental image 26 is extracted for every J pixels or information corresponding to the ... vertical pixel of each vertical elemental image 26 is extracted for every K pixels". The emphasis above is on "or", whereby it appears from the specification that either horizontal OR vertical pixels are used for the reconstruction. The specification does not describe both horizontal AND vertical pixels being used.

Commensurate with MPEP 2173.03, and given that no claim is read separately and apart from it corresponding specification disclosure, and given this inconsistency between the claimed requirements and the specification, renders the claim indefinite. Should claims 2 and 3 require that either horizontal OR vertical pixels be used in the claimed processing (assuming the specification is correct), or should the specification be interpreted as both horizontal AND vertical pixels are used for the reconstruction? Clarification of this question should serve to mitigate this rejection.

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 1, and therefore claims 2-14 by dependency, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the

art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1, as amended, now requires "each of the arrays of pixels [be] defined by a plurality of arrays of lenses". This limitation requires that each of the arrays (e.g., numeral 34 of figure 3; and as depicted in figures 2A and 2B as the individual images of the dice) be defined by (i.e., formed by) a "plurality of arrays of lenses". The disclosure at best describes how each of the arrays is formed by a SINGLE LENS within an array of lenses, as depicted in figure 1 at numeral 32. That is, according to the specification, each lens 32 of the array 24 of figure 1 produces a single image of the object 22, as depicted in figures 2A and 2B. That single image is recorded by a corresponding array of pixels of a detector as depicted in figure 3 at numeral 34. There is NO DISCLOSURE of each of the arrays (e.g., numeral 34 of figure 3) being formed by or defined by a PLURALITY OF ARRAYS OF LENSES. This would require, for example, several more arrays 24 of figure 1 and it is not clear where and how they would be positioned with respect to the first array to form multiple images on the same pixel array 34. Not only is not described in the specification, it is seemingly impossible and not likely to work given that numerous overlapping optical images taken from lenses of multiple arrays would be optically imaged onto the same detector array space 34. Therefore, it is the examiner's contention that one skilled in the art would require undue experimentation to make and use the invention commensurate with the requirements of claim 1.

Given the known nature of the disclosed invention, the following correction will be assumed for claim 1 for examination purposes: "each of the arrays of pixels defined by <u>a single lens of an array</u> ~~a plurality of arrays~~ of lenses".

NOTE: Independent claim 22 is NOT rejected as it properly defines essentially the structure defined in figure 1, without the "plurality of arrays of lenses" requirement.

***37 CFR 1.105***

10. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

Each of applicant's claims rely upon, in large part, the subject matter of "processing information corresponding to said periodic pixels to reconstruct an image from a view angle of the three-dimensional object, said periodic pixels defining said view angle" (i.e., claim 1, lines 7-9). The only detailed disclosure of this processing appears at specification page 6, lines 11-24. However, upon reading this section of the specification, the examiner remains uncertain as to what the "processing" is, or how it is performed. That is, elemental images of an object are captured as depicted in figures 2a and 2b. These are multiple images of the object taken from slightly different viewpoints. This is well understood. However, the specification then describes the reconstruction of an image from a viewpoint as extracting "information corresponding to first pixels, e.g., selected horizontal pixels, at a selected period or interval, and extracting (or retrieving) information corresponding to second pixels, e.g., selected vertical pixels, at a selected period or interval" and "processing this information to in effect superposition these pixels yields a reconstructed image" at specification page 6, lines 11-15. This is the extent of the disclosure of the "processing". However, it is not clear how the selection of horizontal and vertical pixels at an interval (or period), and then superimposing these pixels yields a picture from a certain

viewpoint. For example, each image of the array of elemental images as depicted in applicant's figures 2a and 2b is already of a certain viewpoint, as dictated by the specific lens in the array that focused the image (e.g., figure 1, numeral 24). It is also clear from the specification that each elemental image is received by a certain section of the overall detector as depicted in figure 3. However, what is not clear is how (as described at specification page 6, at lines 17-21) extracting every 34$^{th}$ pixel from the array of figure 3 and superimposing these pixels yields an image from a certain viewpoint. For example, using a simplistic scenario, say that there are four elemental images, each having four pixels:

| | | | |
|---|---|---|---|
| 1A | ***1B*** | 2A | ***2B*** |
| ***1C*** | ***1D*** | ***2C*** | ***2D*** |
| 3A | ***3B*** | 4A | ***4B*** |
| ***3C*** | ***3D*** | ***4C*** | ***4D*** |

Each of these elemental images, 1-4, having pixels A-D, for example, represent a single view as captured by a single lens of the micro-lens array of applicant's figure 1. Now, according to the specification, an image is "reconstructed" from a viewpoint by processing these images by

extracting certain pixels at a selected period. For example, say every second ($2^{nd}$) pixel in the horizontal and vertical are captured, as highlighted in italicized bold above. Then, how are these pixels processed to yield a picture from a certain viewpoint? How are they superimposed as described by the specification at page 6, line 15. The specification does not make this clear, and given that this processing is prominently claimed, clarification on the record is required (without adding new matter to the specification). If this processing corresponds to something well known in the prior art, then the examiner requests any art know to the applicant's that would clarify this. If this technique is NOT well known in the art, then the specification as currently written is deficient. The examiner has chosen not to advance an enablement rejection at this time because the Gottfried reference, as applied to the claims hereinbelow, teaches one such technique and the state of the prior art is taken into account for purposes of assessing enablement. However, if Gottfried does not in fact teach the applicant's claimed pixel processing, then enablement may well be an issue in a subsequent action. For the time being, in order for the examiner to make a determination regarding enablement for the "processing" steps in the claims, applicant is required to provide an explanation on the record as to how the processing is effected (i.e., clarify what is meant by specification page 6, liens 11-24). Again, if it is well known, then the examiner requests any such prior art known to the applicant's that my shed light on the nature of the processing.

This requirement is an attachment of the instant Office action. A complete reply to the enclosed Office action must include a complete reply to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1-5, 7, 10-12, 22, 24-29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gottfried et al. (US 6,483,644 B1) and McCormick et al. (US 6,535,629 B2).

As a precursor to the rejection, a brief summary of the Gottfried reference, as it pertains to the claimed subject matter, will be described. Gottfried captures a perspective image sequence (e.g., figure 5b) and interweaves the elemental perspective images (e.g., figure 3) for display. The interweaving process is a digital process, whereby the interwoven image is stored in a memory array ("computer memory as an array" at column 4, line 52). In one of the preferred embodiments, there are nine elemental images ("three by three array of perspective views" at column 6, line 17), from which each image is converted to a desired resolution, divided into cells having 3X3 elements (or pixels), where every third pixel in both the horizontal and vertical direction are extracted for placement into the interwoven image at a corresponding position (column 6, lines 25-46). The process is repeated for the remaining elemental images, where the final interwoven image has individual cells, each having 3X3 elements taken from each elemental image (e.g., as depicted in figure 3).

Regarding **claims 1-4 and 12**, Gottfried discloses:

extracting information corresponding to periodic pixels from an array of pixels (e.g., "pixels are selected as every third pixel horizontally and vertically" at column 6, line 30) having an elemental image array ("each view" at column 6, line 26, has an elemental image array; i.e., "elements from each perspective view ..." at column 2, line 51) of a three-dimensional object formed thereon ("objects in the scene" at column 5, line 23; as depicted in figures 5-6, the elements of each elemental image comprises objects in a scene); and

processing the information (this limitation is met in several ways: for example, first, the "interweaving process" at column 6, line 5 is a processing of the image information; second, "digital image manipulation/compositing" is disclosed at column 6, line 47; third, the image can be "enlarged" by processing the image information at column 10, line 33; finally, the image information is processed for projection display at column 10, line 52-65) to reconstruct an image from a view angle of the 3D object (the entire purposes of the aforementioned processing taught by Gottfried is to reconstructed an image from a selected view angle, as depicted in figure 8), the periodic pixels defining the view angle (the periodic pixels, once processed by the aforementioned "interweaving process", are stored in a "computer memory as an array of cells, each cell subdivided by view elements" at column 4, line 51; this is depicted in figures 3-4; each view element is a pixel that represents a view from a particular view angle; again, this is depicted in figure 8).

Regarding **claim 5**, digital image processing is disclosed to improve image quality ("digital image manipulation" at column 6, line 46; "resolution of the interwoven image is increased" at line 57).

Regarding **claim 7**, the reconstructed image is recorded (the interwoven image is initially recorded in a "computer memory" at column 4, line 51; in addition, it can be printed out at column 6, line 58-59, or it can be recorded on "digital film" at column 10, line 31, or "stored electronically" and "projected" at column 10, lines 53-65)

Regarding c**laims 10 and 11**, the reconstructed image is display through an LCD (column 10, lines 55-64).

Regarding each of the above claims, and in response to the newly added limitations to claim 1, Gottfried captures a perspective image sequence (e.g., figure 5b) using a plurality of cameras arranged in an array to capture images of the object from a plurality of vantage points.

Gottfried does not teach "plurality of arrays of pixels each having an elemental image array of a three-dimensional object formed thereon" where "each of the arrays being defined by one lens of an array of lenses and a corresponding plurality of detectors" (as assumed to be required by claim 1 – see the 112, first paragraph rejection above).

McCormick teaches a method of capturing a plurality of images from different perspective viewpoints, comprising an array of lenses receiving light from an object (figure 1, numerals 12, 14, 15 and 16 are each an array of lenses; any one of these meets the claim requirements) to generate an array of images of the object (figures 2-4), a lens position to received the array of images (figure 1, numeral 19) and to focus the images onto a detector (figure 1, numeral 21; "CCD" at column 3, line 3). Regarding the newly added limitations to claim 1, McCormick teaches:

A "plurality of arrays of pixels each having an elemental image array of a three-dimensional object formed thereon" at figures 2-4; and

"each of the arrays being defined by one lens of an array of lenses and a corresponding plurality of detectors" (as assumed to be required by claim 1 – see the 112, first paragraph rejection above) at figure 1. That is, separate images of the object are captured by each of the lenses of the array 15 in figure 1, and each of these images are appear on a plurality of detector elements on CCD 21 as depicted in, for example, figure 4.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to replace the array of cameras required by Gottfried, with the image capture device taught by McCormick, in order to capture the plurality of images from different perspective because the McCormick capture device is simpler, requiring only one optical system and one detector, and whereby "continuity of parallax throughout the viewing angle is achieved" (McCormick, column 2, line 63) thus resulting in a more realistic, more believable reconstructed image.

The system of independent claim 22, and dependent claims 24-29 and 34 are met by the Gottfried and McCormick combination above. That is, regarding claim 22, Gottfried discloses:

Processing image information (figures 5; (this limitation is met in several ways: for example, first, the "interweaving process" at column 6, line 5 is a processing of the image information; second, "digital image manipulation/compositing" is disclosed at column 6, line 47; third, the image can be "enlarged" by processing the image information at column 10, line 33; finally, the image information is processed for projection display at column 10, line 52-65) to extract information corresponding to periodic pixels from arrays of pixels (e.g., "pixels are

selected as every third pixel horizontally and vertically" at column 6, line 30) to reconstruct an image from a view angle (the entire purposes of the aforementioned processing taught by Gottfried is to reconstructed an image from a selected view angle, as depicted in figure 8) of a three-dimensional object ("objects in the scene" at column 5, line 23; as depicted in figures 5-6, the elements of each elemental image comprises objects in a scene), the periodic pixels defining the view angle (the periodic pixels, once processed by the aforementioned "interweaving process", are stored in a "computer memory as an array of cells, each cell subdivided by view elements" at column 4, line 51; this is depicted in figures 3-4; each view element is a pixel that represents a view from a particular view angle; again, this is depicted in figure 8).

Gottfried, as described above, does not teach the image capture apparatus required by claim 22.

McCormick discloses:

an array of lenses receiving light from a 3D object (figure 1, numerals 12, 14, 15 and 16 are each an array of lenses; any one of these meets the claim requirements) to generate an array of images of the object (figures 2-4);

a lens position to received the array of images (figure 1, numeral 19);

a detector receiving the array of images from the lens to generated digitized image information (figure 1, numeral 21; "CCD" at column 3, line 3), said detector comprising arrays of pixels receptive to said array of images (e.g. figure 4; the overall detector captures sub-arrays of images as depicted in figure 4); and

a processor connected to the detector processing the digitized image information (figure 6, numeral 73) to reconstruct an image of the 3D object (the output of numeral 73 is a reconstructed version of the original image which is displayed at figure 1, numeral 28).

The combination and motivation therefor is the same as for claim 1 above.

Regarding **claim 24**, the array of lenses is a micro-lens array ("microlens ... array 12" at column 2, line 40; also, "microlens array" at column 2, line 47).

Regarding **claim 25**, the microlenses are circular ("spherical" at column 2, line 41) and refractive (inherent; microlenses are "lenses", and lenses refract light by their nature; i.e., refracting light is how a lenses focuses optical energy).

Regarding **claim 26**, the lens has a magnification to project the image of the array onto the detector (as seen by the optical flow arrows in figure 1).

Regarding **claim 27**, the detector is a CCD ("CCD" at column 3, line 3).

Regarding **claim 28**, a 2D display is connected to the processor to display the image of the 3D object (figure 1, numeral 26).

Regarding **claim 29**, an LCD is disclosed ("LCD" at column 3, line 17).

Regarding **claim 34**, the 3D inverse DCT stage of McCormick (i.e., figure 6, numeral 73) is a digital image processor that, by virtue of performing inverse DCT processing to restore the image, improves the image quality (i.e., without this digital processing, the image would be terrible).

Applicant's Remarks Received on March 21, 2005

Applicant's Remark: Regarding independent claim 1, the "proposed combination fails to teach or suggest 'a plurality of arrays of pixels each having an elemental image array' and 'each of said arrays of pixels defined by a plurality of arrays of lenses and a corresponding plurality of detectors'" at page 14, first paragraph of the remarks.

Examiner's Response: Disagreed. The Gottfried et al. reference requires the capture of a plurality of images of an object from a plurality of viewpoints (e.g., "three by three array of perspective views" at column 6, line 17). While Gottfried utilizes, for example, a single image capture device positioned at a plurality of viewpoints to achieve his array of perspective views (e.g., figures 5), Gottfried does not capture elemental images using an array of lenses and corresponding detectors. However, this is exactly what McCormick teaches. That is, McCormick teaches:

a "plurality of arrays of pixels each having an elemental image array of a three-dimensional object formed thereon" at figures 2-4; and

"each of the arrays being defined by one lens of an array of lenses and a corresponding plurality of detectors" (as assumed to be required by claim 1 – see the 112, first paragraph rejection above) at figure 1. That is, separate images of the object are captured by each of the lenses of the array 15 in figure 1, and each of these images are appear on a plurality of detector elements on CCD 22 as depicted in, for example, figure 4.

Applicant's Remark: Regarding independent claim 22, applicant notes the claim as incorporated the elements of dependent claim 23 which was previously not rejected over the prior art. This was an oversight by the examiner, as the elements of claim 23 were fully met by Gottfried as described in the previous rejection of claim 1. Therefore, claim 22 as amended is now rejected over the combination of Gottfried and McCormick. This office action is non-final.

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gottfried et al. (US 6,483,644 B1) and McCormick et al. (US 6,535,629 B2) as applied to claim 5 above, and further in combination with Baxes (image processing text, titled "Digital Image Processing").

While Gottfried discloses digital image processing to improve image quality ("digital image manipulation" at column 6, line 46; "resolution of the interwoven image is increased" at line 57), Gottfried does not teach contrast enhancement.

Baxes teaches digital contrast enhancement (pages 73-75) to achieve a "well balanced" image so as to "recreate the exact characteristics of that scene" (page 75, top paragraph).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Gottfried's digital image manipulation algorithm, to include digital contrast enhancement as taught by Baxes, to improve the overall image balance and thereby recreate, as close as possible, the characteristics of the original scene.

14. Claims 8, 9, 13, 14, 30-33 and 36-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gottfried et al. (US 6,483,644 B1) and McCormick et al. (US 6,535,629 B2) as applied to claims 5 and 28 above, and further in combination with Lawrence et al. (US 2003/0137688 A1).

Regarding claims 8 and 9, while Gottfried discloses the electronic storage and projection of the interwoven images through a display device (i.e., column 1, lines 53-65), Gottfried does not teach conveying the image through a network, including a local area network or the internet.

Lawrence teaches a digital network whereby pictures can be sent to and from users of the network to other users via. the internet (figure 1, and as described above).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to transmit the reconstructed (i.e., interwoven) pictures of Gottfried, to user's who wish to view the pictures over a network, such as the digital cable and internet system taught by Lawrence, in order to provide a means of propagating the pictures quickly, accurately and efficiently to others who wish to view them.

Regarding claims 13 and 14, for the same reasons and motivation above, it would have been obvious to transmit the pictures captured by Gottfried's capture system (e.g., figure 5b) over a network for processing and reconstruction at a location remote from the capture system in a manner that is quick, accurate and efficient.

Regarding claims 30-33 and 36-41:

McCormick teaches the transmission of the images via convention "television transmission" (e.g., column 3 line 48).

Regarding claims 33 and 41, McCormick already teaches an array of lenses (figure 1, numeral 28) positioned to receive light from the 2D display (numeral 26).

Regarding claim 37, McCormick teaches an LCD display ("LCD" at column 3, line 17).

Regarding claim 30, McCormick does not teach the display device connected indirectly to the processor by a network.

Regarding claim 31, the network is not a local or wide area network, or an intranet or the internet.

Regarding claim 32, the display is not connected indirectly to the processor by a remote processor connected to the network.

Regarding claims 36-41, McCormick does not teach a "plurality" of 2D display devices indirectly connected to the processor.

Lawrence teaches a system in the same problem solving area of transmitting television pictures ("digital cable network" at paragraph 0027), comprising:

regarding claims 30 and 36-41, a "plurality" of display devices (figure 1, numerals 11; a plurality of users, each having a display, is disclosed) connected indirectly to a signal source (numeral 2) by a network (the cable "network", depicted in figure 1, at numerals 7 and 9).

Regarding claim 31, the network is a local or wide area network (e.g., a cable network is a wide area network) or the internet (figure 1, numeral 4 and 5; "alternately, services may be delivered from World Wide Web ..." at paragraph 0029).

Regarding claim 32, the displays are connected indirectly to the signal source by a remote processor connected to the network (figure 1, numerals 10 are set-top-boxes connected to the cable network).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the digital cable network taught by Lawrence, in order to transmit the television pictures to the users of the McCormick system, in order to provide the secure, reliable, high speed and quality transmission of the pictures associated with "digital broadcasts" (e.g., Lawrence, paragraph 0027).

***Conclusion***

15. This Office action has a requirement for information under 37 CFR 1.105. A complete reply to this Office action must include a complete reply to the attached requirement for information. The time period for reply to the attached requirement coincides with the time period for reply to this Office action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 571-272-7401. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Art Unit 2621
November 17, 2005

BRIAN WERNER
PRIMARY EXAMINER